



Science News-Letter

The Weekly Summary of Current Science

Reg. U. S. Pat. Off.

A Science Service Publication



Edited by Watson Davis
Vol. XI No. 315

10¢ a copy \$5 a year
April 23, 1927

ARCHÆOLOGY

Finds Explain Visby

Why the beautiful little city of Visby in the Swedish island of Gothland held such unusual commercial power in the Middle Ages has at last been accounted for by archæological finds. Excavations in the northern part of the town recently yielded important remains of extensive iron works. From the evidence archæologists have concluded that during the Middle Ages and possibly even by the end of the Viking Age, Visby was a center for the smelting and refining of iron and copper, which industry contributed greatly to its prosperity.

Pieces of iron ore found indicate that the ore used at the Visby works was imported from Utö Island, near Stockholm, according to John Nihlen, Swedish archæologist, writing in *Art and Archaeology*.

"Thousands of large slag lumps prove the ore had been melted in furnaces," he states. "Numerous objects of iron also indicate that skilled blacksmiths worked the metal. Finally, certain circumstances seem to show that the people of Gothland during this period exported wrought iron to neighboring countries."

"Existence of this iron trade has hitherto been quite unknown," Mr. Nihlen states. "Only the name of the street where the industry was located, Smedjegatan or the Smiths' Street, contains a memory of the time when iron was worked on a large scale in these outskirts of the town."

Visby has been inhabited since a Stone Age period, some 7,000 years ago, and excavations there have revealed innumerable relics of its history through different centuries. Its far-reaching trade relations as its commercial prosperity grew is shown by such articles as a cup made in China and a sea-shell from the Indian Ocean, found in graves dating from the Iron Age.

Science News-Letter, April 23, 1927

PHYSICS



ALBERT ABRAHAM MICHELSON

Time Keeper On Light

When an athletic coach wants to see how fast a runner can go, he measures the time it takes him to run a known distance, and when Prof. Michelson wanted to see how fast the messenger which brings us knowledge of the most distant stars and galaxies—a beam of light—travels, he timed it between two California mountain peaks. And by his results we know that in a single second a beam of light will travel 299,796 kilometers.

Many years ago, in a classical series of experiments, he started the train of thought which finally produced the theory of relativity; a new standard for measurement was given the world when he determined the length of the meter in terms of an invariable wave length of light; and his interferometer has made possible measures of the diameters of some of the largest stars. All these achievements have brought him many honors, including the Nobel Prize in Physics, and the presidency of the National Academy of Sciences, which meets in Washington next week, April 25 to 27.

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ELECTRICITY

New Electrical Insulator

Cheaper electric lights and less expensive electrical heating are possible outcomes of recent work on electrical insulations by a group of Russian scientists, under the leadership of Dr. Abram Joffe, head of the Physical-Technical Institute of Leningrad.

Dr. Joffe describes his researches on a new type of insulating material, which scientists believe may revolutionize the whole aspect of high-power transmission problems, in the *Journal of Mathematics and Physics* of the Massachusetts Institute of Technology. As a result of this work, entirely new ways of manufacturing electrical insulators may be opened up.

He has found that a very thin layer of a comparatively cheap and readily available varnish-like material substitutes for the large bulky porcelain insulators now used. Investigation of the dependence of dielectric strength; that is, the resistance to electrical puncture or breakdown on the thickness of a sample has shown that considerable potentials can be insulated by very thin films, their dielectric strength approaching the tremendous figure of 100,000,000 volts per centimeter of insulator thickness.

In addition to giving the electrical industry a new insulating material, Dr. Joffe's work gives the experimental physicist a new method of subjecting materials to immense pressures. When the electrical current is in a wire it creates pressure at the wire's surface in trying to get out. Since Dr. Joffe's new insulating material resists the electricity's efforts for freedom more strenuously than other materials, greater pressures are created at the surface of the conductor than ever before obtained. He has obtained the extraordinary pressure of 300,000 atmospheres, some 4,500,000 pounds per square inch. The highest pressure previously obtained in scientific work

(Just turn the page)

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New Insulator

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has been 40,000 atmospheres, secured by Prof. P. W. Bridgman of the physics department at Harvard. Since such high pressures squeeze the atoms of the metal tighter together than ever before, it is predicted that new knowledge about the properties of matter, especially the spacing of the atoms, will result.

In high voltage power transmission, high potential currents are likely to flash from pole to pole to other wires, and sometimes to the ground. To prevent this, there are used high towers equipped with crossarms that hold the wires a considerable distance apart, suspended from costly porcelain insulators. With the new methods it may be possible to reduce the size of the insulators, so that the wires can be laid in conduits, thus doing away altogether with the expensive pole construction in use at present.

Dr. Joffe has been studying the problem of electrical insulation for many years and is at present engaged in giving a course of lectures on the electrical and elastic properties of solids in the department of physics at the University of California. American physicists are of the opinion that Dr. Joffe's new discoveries, when more completely developed, will have not only the highly desirable practical results of making electrical heating and lighting cheaper, but will be invaluable in the branches of engineering and physics that employ high voltages.

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In 1913 there were 6 rubber manufacturers in Japan; now there are 180.

The house shortage in Germany is held responsible for some mental disease.

News-Letter Features

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SCIENCE NEWS-LETTER, The Weekly Summary of Current Science. Published by Science Service, Inc., the Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Publication Office, 1918 Harford Ave., Baltimore, Md. Editorial and Executive Office, 21st and B Sts., N. W., Washington, D. C. Address all communications to Washington, D. C.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeograph form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

Subscription rate—\$5.00 a year postpaid. 10 cents a copy. Ten or more copies to same address, 6 cents a copy. Special reduced subscription rates are available to members of the American Association for the Advancement of Science.

Advertising rates furnished on application.

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Flowers Re-Tell Old Fairy Tales

By FRANK THONE

Fairy-tales belong to youth. Whoever can listen to fairy-tales with pleasure has not quite lost his childhood, and whoever can tell them to a child without wearying has not yet grown old.

Thus it is that not the least part in our paradoxical feeling that we are younger in April than we were in the preceding March and February comes from the sight of the lovely fairy-tales we see published all about us in the bright flowers of the woods. And in her unwearying repetition of these tales, spring after spring, our mother the earth, whom we are accustomed to call ancient, informs us with a dash of coquetry that she isn't old yet.

The story that comes most readily to mind, of course, is the Sleeping Beauty. The evil magician is the cold north wind in the fall, the hundred years are the hundred days of winter, the enchanted wood is any wood at all, the beautiful princess is a spring beauty or trillium or bloodroot or any white flower you choose, and the ardent young prince whose kiss ends the enchantment is the warm spring sun.

Or you may reverse the characters and consider the sun in the feminine, as the Germans do; and lo, you have Beauty and the Beast. For the wooing of the gentle sunshine does break the bonds of the rough, bare earth, clothing the hills gallantly in green, and changing the woods from a thrusting mass of savage, bristling branches into the strong noble being that a forest properly is. Or with the sun again as the Prince, we have the story of Cinderella, the immortal theme of the lifting up of the lowly that has been sung ever since ancient Egypt, and even finds its place in our highest religious poetry, such as the chant of the Magnificat.

The fairy tales of spring found their way into the religion of classic Greece and Rome, too, as in the immortal story of Persephone, who was carried off from her mortal spouse by the covetous lord of the Lower World. The bereaved husband, Orpheus, sought her in the gloomy kingdom over which she had been forced to reign, only to lose her again when he almost had her back to the sunlight. Finally through the intercession of her mother, a compromise was affected, by which she was permitted to live on earth half the time but had to return to the realm of Dis for six months of

each year. This myth of winter and spring is so plainly an allegory that it is doubtful whether any but the most simple-minded of the ancients believed that the characters in it were anybody but the flowers, their enemy the black frosts of winter, and their natural lover the sun.

But finding the shining people of the fairy-tale and classic myth is not the only magic that spring makes possible in the forest. Whoever is so fortunate as to live in or near a bit of woodland is given, during the round of each year, a long ride on a magic carpet as marvelous as any that the tales of the Arabian Nights can tell of.

Every wood is an enchanted wood. In summer, when we go camping and become temporary gypsies and Indians, the familiar forest is its proper self, giving right housing for gypsies and hiding for Indians. But as fall comes on it changes—changes as completely as though its roots were grown into a magic carpet that had moved it hundreds of leagues to the westward, into the dry desert. Only the toughest-leaved trees remain green; the rest let go their foliage and become, for all practical purposes, dead trees, and might as well be cancelled out of the account. A tree without its leaves does less actual living than a clump of grass a hundredth of its size. In this desert-forest of the fall there are still many green things; and interest-

ingly enough these autumn flowers and weeds belong predominantly to botanical families that are common in deserts. Then comes winter, and the magic carpet gives the forest another long trip, this time to the frozen north. All the trees are cancelled now, for even the dark evergreens do very little living in the winter, and the desert-cousined plants of the autumn undergrowth are dead and cancelled, too. Only down among the dead leaves and the mosses we find the small creeping things of the tundras and glacier-fronts; bearberry and wintergreen and twinflower and shinleaf. These vegetable Eskimos know how to endure the cold, and can take advantage of the earliest thaws to do a little growing. In winter the forest is again a desert, but it is a tundra desert.

But early spring is a time of shriven sins, and resurrections, and hopes of life everlasting. And spring, anywhere north of the tropics, is surprisingly alike everywhere, whether in eastern forest or western desert or northern tundra. Spring travels as a wave, starting in March in the dry chapparral of northern Mexico and arriving even in the Arctic islands by late June or July. But as the wave moves, it brings the same blessings everywhere: a quickening sun, thawed snows, warm rains and drying breezes. Even in the desert, spring brings rain,

(Just turn the page)



FLOWERING DOGWOOD is perhaps the finest of native American flowering shrubs. It fills the open woodland with what seems to be a snowstorm hung motionless in midair.



DOG-TOOTH VIOLETS are among the loveliest of spring flowers, but would be better called by a less-known name, "fawn lilies," suggested by their mottled leaves.

Flowers

(Continued from page 255)

and the rain brings flowers of a delicacy that makes them a never-ending surprise, so little would one expect such things among the cacti and the harsh, gnarled stems of the bushes of the chapparal.

So also spring brings its most dainty and delicate flowers first to our forests; brings them when the trees and underbushes are of a nakedness and harshness hardly rivalled by the chapparal of the desert. The magic carpet has moved again, and the forest is returning by the same path it took in departing; coming home by way of the West. The early spring flowers of forest are surprisingly like the early flowers of the desert spring in their general appearance of a fragility unsuited to the rough world into which they have been born, as well as in their brief and fugitive life-span. None of

the flowers that blossom among the chapparal stems are more completely gone by summer than are the spring-beauty and the bloodroot.

But it is not only the tender herbs of the forest and desert floors that resemble each other in their spring-time behavior. Many of the forest trees and bushes also burst into bloom in the early spring, some of them before they have any trace of leaves, and others while the leaves are still uncurling from the buds. The splendid flowers of the desert ocotillo, turning the rigid, savage rods of the bush into a living flame, come not forth on branches more naked than those that are graced by the flowers of the wild plum, red-bud, spice-bush, and the less showy blossoms of the maples, beloved of bees. And the crabapple and flowering dogwood are shedding showers of pink or pearly snow before their leaves can be fairly seen as leaves.

This desert-behavior of our forests may seem at first blush to be irrational and outlandish. It is possible of understanding that there should be a tundra-stage in winter, when we have a small-scale return of the glacial epoch; but why should there be this springtime similarity between the forest and the desert? The causes are as yet by no means well understood, but at least one plausible explanation may be hazarded: the life-conditions in forest and desert in early spring are really very much alike. In both, in early spring, there is an abundance of water: in the desert from the spring rains, in the forest from the spring thaws. In both there is a warm and genial sun, for the forest has not yet developed its thick roof of leaves that will later shut off the bright day and turn the woods into a great green tent. In both there are freely wandering breezes, not yet hindered in the forest by the same thick growth of leaves; and where there is breeze there is rapid evaporation of water. Rapid evaporation of water is really half of the making of a desert; we commonly think of a scanty water supply as the sole cause of desert conditions, but the rate of its removal is quite as important as the rate of its supply. So that though the springtime woods are well supplied with rain and melted snow, the sun and wind are demanding heavy hourly toll, and we have, beneath the naked boughs, some simulation of a desert climate.

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Mosquitoes are most easily poisoned when in the larval stage.

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Chemists Given Theory of Origin of Life

Following are reports by Dr. Edwin E. Slosson of some of the high-lights of the meeting of the American Chemical Society at Richmond, April 11 to 15. These supplement the reports in the News-Letter for April 16, on page 239.

A chemical theory of the origin of species was presented to the American Chemical Society in a paper prepared by Dr. Victor C. Vaughan, former head of the Medical School of the University of Michigan and foremost authority on epidemics. He goes far back beyond Darwin, to a period long before the appearance of the earliest and simplest single celled plant or animal, which is the point where the biologist begins. For he believes that life is molecular and not cellular. The microscope shows us that cells constitute the structural units of all plants and animals but Dr. Vaughan thinks that the size and shape of these little bags of protoplasm are less important than the composition of their contents. The essential and probably the primary compound of all living matter is protein, which consists of very complex molecules, containing various ammonia, acid and sugar groups.

Dr. Vaughan admits that "up to the present time no chemist has awakened dead matter into life. It may be that this will never be done," but that should not discourage future experimentation in this line. Every element that is found in living matter exists in the mineral kingdom, and the chemist has learned that he can now make, out of the inorganic material of earth and air, many organic compounds formerly found only in plants and animals. As this gap between the inorganic and organic is being gradually filled in by modern research, so also is the gap between chemical molecules and living creatures. As he says, "Nearly twenty years ago I first stated my belief that life is fundamentally chemical and may, indeed probably does, exist in simpler and less tangible forms than any living cell, or even the living bacterium." This opinion has since been confirmed by the discovery of minute forms that prey upon the bacteria as the bacteria prey upon us, and by the study of the viruses of plant diseases, which are composed of particles so small as to pass through a porcelain filter, yet grow and multiply like living creatures.

The proteins are very changeable compounds and can be easily altered by disease or chemical action. For instance, an attack of measles in

childhood may make a man immune to the infection for life. A minute amount of a foreign protein, even from a wholesome food like eggs or milk, when injected into the blood renders this article of diet permanently poisonous to that particular person.

The importance of this paper extends beyond the sphere of chemistry into the domain of sociology and ethics. For if Dr. Vaughan's views are confirmed they must radically change current teaching as to the relative importance of heredity and environment.

"I hold that the lowest forms of life have come into existence through chemical agencies," Dr. Vaughan concluded, "And that environment has been a stronger factor in the evolution of life and in the development of the varieties and species than is believed by the biologist of today. All life is protein and the development of new species is due to molecular rearrangement in the structure of the protein molecule. Where a protein has at last been evolved which best fits the functional needs and where its environment remains little changed, its chemical constitution will remain remarkably constant."

Live Wires in Silk

Live wires, attired in ribbons of synthetic silk, were introduced to the chemists by Dr. W. O. Mitscherling, of Bridgeport, Conn. Viscose made from wood pulp is pulled out into a ribbon and after purification is wrapped around the wire while still wet. There it sticks tight and shrinks, making a very close fit, and serving as an excellent insulator. The coating can be made quite transparent, and in this form it is of especial value in constructing radio sets, for the whole wiring and soldering job can be inspected for breaks and other troubles without unwrapping or scraping anything.

A metal that takes fire when breathed upon was one of the novelties exhibited. It is barium, an element more or less similar to calcium, not uncommon in minerals but now for the first time obtained in pure form and large yield by a process discovered by Prof. R. A. Baker and A. J. King, of Syracuse University. They distil off the metal in a vacuum from a mixture of aluminum and barium oxide and get

barium 99.95 per cent pure. It is a soft and shining metal, somewhat resembling sodium. It is an extremely active and avaricious element, attacking with violence almost every substance brought into contact with it. Moist air sets it aflame. It can only be handled in glass tubes filled with argon, a gas so inert that it unites with nothing. On account of the avidity of barium for the gases of the air it may be useful in removing the last traces of air from vacuum tubes made for electric lamps and radio receivers.

Classifies Smells

We may some day be able to recognize passing smells as we can now recognize passing autos, by reading off their numbers. E. C. Crocker and L. F. Henderson, of Cambridge, Mass., have worked out a system of tagging odors. They recognize four basic types of smell-perception: "sweet," "acid," "burnt," and "caprylic." Almost no scents belong wholly to any one of these classes, and most of them include all four in varying degrees. With a series of numbers from 0 to 9 to represent intensities, the investigators are able to designate every scent. The ordinal position of the digit indicates its class. Thus rose perfume smells like 6423; sweetness, its predominant characteristic, being represented by 6. Vinegar smells like 3803, the 8 indicating the strong acid smell and the 0 the absence of any burnt odor. But "burnt" is the strongest thing about freshly roasted coffee, which, however, also has a good deal of both "sweet" and "acid," and hence gets the number 7683. Perhaps the belles of the future will have perfumes compounded to match their car numbers, or co-eds will scent their compacts with the signal for a forward pass.

Seeing the Invisible

The vision of the chemists of the American Society was carried to the verge of the invisible and beyond by the demonstration of the ultra-microscope by F. F. Lucas of the Bell Telephone Laboratories. Pictures of thin sections of alloys thrown upon the screen showed the details of the various constituents and disclosed the causes of the strength or weakness of the metal.

(Just turn the page)

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By William Foster, A. A. S., of Princeton

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Chemical Meeting

(Continued from page 257)

An incipient crack started in the edge of a strip of nearly pure iron by thousands of bendings was seen to have followed the line of the scattered inclusions of non-metallic material. By means of this instrument it is possible to make visible a particle of only one-five-millionth of an inch across, and by the use of the shorter waves of ultra-violet light the magnification and definition can be carried considerably further. Photographed in the dark, the particles so made perceptible are composed of only about five hundred atoms; so the microscopist must have nearly reached the chemist's limit of divisibility.

But the speaker who followed, Prof. Victor Henri of the University of Zurich, went beyond this point, and by the employment of X-rays and analytical mathematics, he demonstrated the arrangement in space of the five atoms forming the fundamental compound of carbon, methane. It has hitherto been surmised that the carbon atom occupied a position in the center, with the four hydrogen atoms around it at equal distances, but according to the new theory the shape of the molecule is a pyramid instead of a tetrahedron. The determination of the structure of the carbon atom is of primary importance, since all living matter, plant and animal, is composed of carbon compounds.

Say you saw it advertised in the SCIENCE NEWS-LETTER

Longer Life With Vitamins

How to double the length of life, maintain health, increase the birth-rate, and postpone senility by a properly balanced diet was demonstrated by Prof. H. C. Sherman of Columbia University. It is disappointing to find that he is talking about rats, but we must remember that experiments on rats often lead nowadays to knowledge of diet and drugs which is applicable to man. In fact, Prof. Sherman himself says:

"There is no reason to doubt and ample reason to believe that similar improvement in nutrition with resulting increase of vitality and higher degree of health with longer life and especially a longer duration of the prime of life, can be realized in human experience by a like improvement of the food even though the original food supply is already adequate according to current standards."

On lantern slides he showed the photographs of twin brothers or sisters at an age which in the rat family corresponds to eighty in the human family. One rat was perky, sleek, upstanding and bright-eyed. The other was dull and doddering, with hanging head and falling fur. The secret of the difference lay in the proportion of vitamins and minerals in their diet. The first rat, for instance, had been fed on a mixture of one-third dried whole milk and two-thirds whole wheat, and the second rat on one-sixth milk and five-sixths wheat. The former had a liberal supply of vitamin A and lime; the latter had merely an adequate amount.

Germans Reinstated

The chemists remembered the decennial of American participation in the world war in their own way, by restoring to honorary membership Dr. Wilhelm Ostwald and Dr. Walter Nernst, famous German chemists who had been dropped from the rolls during the war. Many of the American chemists who then voted to expel their German colleagues were foremost in advocating their restoration to membership. Honorary membership was also voted to another German, Dr. R. Willstaetter, one of the world's most eminent authorities on organic chemistry.

Science News-Letter, April 23, 1927

There are almost 3,500 languages and dialects in the world, of which more than half are in America.

Medicine's Experimental Advances Reported

The eight leading societies devoted to experimental medicine and biology met at Rochester, N. Y., April 14, 15 and 16. Nearly a thousand scientists attended the meetings of the Federation of American Societies for Experimental Biology, comprising the Physiological Society, the Society of Biological Chemists, the Society of Pharmacology and Experimental Therapeutics and the Society for Experimental Pathology, and also the American Association of Pathologists and Bacteriologists, the American Association of Immunologists, the American Association for Cancer Research and the International Association for Medical Museums. The high lights of these meetings, as reported by Watson Davis, are given below.

Heredity Controls Cancer

No germ is guilty of causing cancer. Instead, in the inheritance that parent hands on to child, lies susceptibility or freedom from this dreaded disease.

Such is the conclusion of Dr. Maud Slye, based on the evidence of 80,000 mice. Her theory that conditions favorable to cancer are inheritable disputes the claims of the English scientists, Gye and Barnard, who recently reported the discovery of a cancer-causing organism.

For the past eighteen years in her laboratories at the University of Chicago, Dr. Slye has been breeding mice to throw light on the nature of cancer. She has colonies of mice practically every member of which develops cancer. Other colonies, living in the same room, are so resistant that cancer never occurs.

Just as shape of nose, color of hair and eyes and other characteristics of fathers and mothers are reproduced in their children, so the mice pass on to their progeny their susceptibility or resistance to malignant growths. By proper matings, Dr. Slye can breed out the cancer producing strains in two generations—or she can condemn the mouse family to have cancerous progeny without failure generation after generation.

Equally as important as the inherited susceptibility is a wound or injury that allows the cancer to get a start, Dr. Slye has found. Mice of a cancer family seem to lack a controlling factor in their issues that allows injured cells to run wild and form the malignant tumor mass.

Mice react physically to drugs and disease so much like men that Dr. Slye believes that it is likely that the cancer of human beings also is inherited. Human beings are so complex in their inherited qualities that the laws governing the inheritance of cancer are probably very complex.

Yet it is conceivable that thousands of people need not fear the development of cancer on account of their resistance to the disease. If three generations of accurate statistics on cancer patients were kept by all physicians, Dr. Slye explained, the problem of cancer inheritance in the human race could be solved.

Cancer in Twins

A remarkable case of cancer in identical twins, tending to support Dr. Slye's theories, was reported by Dr. Alfred S. Warthin of Ann Arbor, Michigan. Twin sisters, mirror images of each other, alike in character and tastes, grew up together, had mumps and measles at the same time. They both married at the age of eighteen, a year later each had a child of the same sex and when their children were a year old, both obtained divorces. The next simultaneous performance was appendicitis. The operations revealed that one twin's appendix was on the right side, as it should be, but the other had her appendix on the left side. This is in accord with the theory that identical twins were at an early stage before birth actually the same organism. Then both twins developed cancers in the same organ of the body. Operations were performed but the cancers recurred and the twins died together, as they had lived. Dr. Warthin cited cases of three other sets of twins who had suffered from identical cancers.

Drunkenness Test

A chemical test for drunkenness has been developed by Dr. Emil Bogen, of the University of Cincinnati, in cooperation with the police department of Cincinnati.

It promises to make it hard for the inebriate to tell the judge he "didn't have a drop," for Dr. Bogen's chemicals detect the alcohol in a man's breath and tell just how intoxicated he is. Physicians attending stated that the new test would prove useful in distinguishing between persons injured and exhibiting symptoms similar to intoxication and those actually under the influence of alcohol.

The apparatus used for the test is exceedingly simple and could be used effectively by any trained nurse or physician. The alcoholic suspect is persuaded to blow up an ordinary

football. The sample of his breath thus obtained is passed through a solution of a chemical, called potassium dichromate, which changes color from yellow to green depending upon how much alcohol the breath contains.

Dr. Bogen has devised a scale of alcoholic intoxication based on the amount of alcohol found in the body through the use of his test. When the quantity is less than one-tenth of one per cent., the person is "dry and decent"; one to two-tenths per cent., "delighted and devilish"; two to three-tenths per cent., "delinquent and disgusting"; three to four-tenths per cent., "dizzy and delirious"; four to five-tenths per cent., "dazed and dejected"; more than half of one per cent., "dead drunk". More than a half per cent. is likely to cause death.

In standardizing the new alcohol test a group of scientific martyrs composed of physicians and internes imbibed measured amounts of alcohol and allowed tests to be performed upon them. It was discovered that the test does not reveal the amount of alcohol imbibed, but that it does accurately tell the amount absorbed by the body. One subject became only mildly intoxicated after drinking a half pint of pure alcohol.

Over 500 drunks picked up by the Cincinnati police have been tested by Dr. Bogen, and his test data have been used in fifty traffic court trials where the severity of the sentence depended upon whether or not the offender was intoxicated while driving.

Some of those tested got their tongues twisted when the test showed less than one-tenth per cent. alcohol, but none could talk absolutely soberly when the tests ran as high as four-tenths per cent.

Motion pictures exhibited by Prof. W. R. Miles, of Stanford University, showed that white albino rats under the influence of alcohol can no more walk the straight and narrow path than human beings under the same conditions. Educated rats that had learned to find their way quickly to food through a maze of blind alleys and elevated runways, became confused, wasted time and fell off when allowed to imbibe.

Myrtillin for Diabetes

Four years ago the discovery of insulin revolutionized the treatment of

(Just turn the page)

Medical Advances

(Continued from page 259)

diabetes. Now Dr. Frederick M. Allen, director of the Physiatric Institute, Morristown, N. J., has announced the discovery of myrtillin, a new substance that might be termed vegetable insulin.

Dr. Allen revealed that myrtillin produces some of the beneficial effects of insulin without some of the greatest disadvantages of insulin. Scientists who heard his paper predicted that myrtillin will make it possible for diabetic patients to safely undergo surgical operations necessitated by another disorder. With present technique such patients have little chance of recovery.

This new preparation was discovered by Dr. Richard R. Wagner, chief of the chemical department of the Physiatric Institute, who has also worked out the methods of producing it.

The leaves of the blueberry or huckleberry are the source of myrtillin, but it can be obtained from the green leaves of certain varieties of plants, especially the myrtle family, from which the name of the substance is taken.

"Myrtillin may be a vitamin," Dr. Allen declared in stating that it is at present a substance of unknown nature, which is believed to be an active constituent in animal as well as vegetable tissues, but is difficult to separate from protein, gums and other colloids.

A source of danger in the use of insulin in treating diabetes is that the patient will have the excess sugar in his blood, the condition characteristic of diabetes, removed too effectively, causing coma and perhaps death. Myrtillin has been found to effectively reduce the condition of excess sugar without removing the normal amount that healthy blood must have, which is about one in 10,000. Moreover, myrtillin has no toxic effects even in large dosage.

When it is necessary to perform a surgical operation on a diabetic patient, the sugar in the blood must be reduced. The present procedure is to reduce the blood sugar by carefully regulated injections of insulin and rigid control of the diet. This requires time and there is always danger of reducing the blood sugar too much. By use of myrtillin, an overdose of which is not harmful, the blood sugar of a patient needing a prompt operation can be reduced to normalcy quickly.

Another advantage of myrtillin, Dr. Allen explained, is that it can be given by mouth whereas insulin must be injected by hypodermic needle. In spite of the fact that its effects are similar to insulin Dr. Allen declared that myrtillin is altogether different from insulin in composition.

Myrtillin has been used in the treatment of patients in Dr. Allen's clinic and its use is thus considered beyond the experimental stage. Detailed results of the clinical application are to be given by Dr. Allen at the meeting of the American Medical Association in Washington in May.

First Crystallized Enzyme

The world's first crystallization of an enzyme, a substance that eggs on chemical changes in the body without actually participating in them, was described by Dr. James B. Sumner, of Cornell. Urease is the substance obtained in pure form and scientists explain that this accomplishment will lead to a better understanding of digestive processes now shrouded in mystery.

Treatment of Dropsy

Success in the treatment of dropsy is reported by Dr. Norman M. Keith, of the Mayo Clinic, Rochester, Minn., who has been able to reduce by means of ammonium nitrate the watery deposits in the tissues which constitute the diseased condition known as edema. Dr. Keith had previously found that ammonium chloride would mobilize the fluid in the waterlogged body, thereby permitting its elimination. Now he has discovered that the similar and equally common salt, ammonium nitrate, is still more efficacious presumably on account of the accessory effect of the nitric acid which is liberated from it in the body. The ammonium nitrate is administered by mouth in capsules and certain mercury containing drugs given at the same time are an aid in the treatment.

Z Blood Factor

A new substance in the blood, provisionally named the Z factor, was introduced to the scientific world recently by Prof. Elbert W. Rockwood, of the University of Iowa, its discoverer. It is similar but not the same as uric acid. In diseases of the blood, like anemia, leukemia and syphilis, the amount of substance Z is increased to three or four times that of the normal blood.

New Drug Plant

From America's own soil there will soon be produced a useful drug heretofore obtained only from a Chinese herb. Dr. Guy W. Clark of the University of California reported to the pharmacologists this morning that he has succeeded in obtaining ephedrine, valuable in increasing blood pressure and treating colds in the head, from two common California plants. This drug is expected to replace adrenalin in some uses and the discovery of an American source assures the supply despite disturbed Chinese conditions.

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Do You Know That—

Victor fish are the most abundant of all fish in the open waters of the Pacific.

Recent investigation indicates that the night heron does not deserve its bad reputation of being destructive to trout.

The perfuming principle found in natural musk, which is an important factor in perfume making, can at last be made in the laboratory.

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FOR

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ZOOLOGY

Penguin's Bronchitis Cured

Penguins are subject to bronchitis and can be cured by the application of remedies for bronchitis in the human race. Ida M. Mellen, of the New York Aquarium, has proved the efficacy of plain brown cough mixture and benzoin fumes by using them to break up the bronchial attack of Charlie, the Aquarium's penguin.

Charlie was brought from the Galapagos Islands by William Beebe. He is the fourth of the Aquarium penguins, the other three having succumbed to bronchitis during past winters.

This winter Charlie, too, felt the rigors of northern temperature and came down with bronchitis. But Miss Mellen was determined that he should not die as the other penguins had done. She had him moved to a tank near a radiator and she began the cough mixture and benzoin treatments. From being unable to swallow, Charlie after the first spoonful of cough mixture recovered sufficiently to eat three killifish. The benzoin fumes likewise soothed his respiratory passages. In all, Charlie took nine teaspoonfuls of cough mixture, given in doses of one teaspoonful twice a day, and twenty-three benzoin treatments, also at intervals of twice a day. In less than three weeks all traces of his cough had disappeared.

Miss Mellen further remembered that, although Charlie was accustomed to water at 50 degrees Fahrenheit, the air in the Galapagos Islands is warm, usually around 110 degrees. She was unable to give Charlie warm air, so she decided to reverse his home environment and give him warm water instead. She had the water in his tank heated to 80 degrees. And Charlie showed his appreciation. More than that, he refrained from indulging in further attacks of bronchitis.

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Mice are the most popular baby food for young horned owls.

Chimneys were first built on European houses in the fourteenth century.

Volcanoes under the sea sometimes lift new islands above the surface.

Most Tornadoes Do Little Damage

By C. F. TALMAN

The tornado that has just wrought death and destruction in Texas is a news event of national importance, and circumstantial information concerning it has been told to the public through the newspapers. Such is not, however, the fate of the average tornado. Of the total number of these storms, averaging about 100, that occur annually in the United States, the great majority attract but little attention.

Though a tornado, frequently misnamed a cyclone, is the most vicious storm on earth, it is a storm of brief duration and covers a relatively small area of the earth's surface. The entire life history of a tornado is usually compassed within less than an hour and the path of destruction is seldom more than a quarter of a mile wide. At any one place along the path the storm does not last more than a minute or so.

A tornado travels over the earth at a speed of from 25 to 60 miles an hour. At the same time it spins on its axis after the manner of a top. It is this rotary movement that causes most of the havoc. Its speed has never been measured, but is supposed, from the terrific feats of destruction accomplished, to amount to 400 or 500 miles an hour in some cases.

The so-called funnel cloud, which is always present in a true tornado, forms high in the air and works its way downward. Wherever it touches the ground it gathers a cloud of dust and debris around its lower end. The cloud marks the location of the atmospheric whirl or vortex, and destructive effects are always limited to its immediate vicinity. The whirl not infrequently rises clear of the ground at places along the path, leaving objects underneath it unharmed.

The vortex is a partial vacuum. When it encounters a building, the air inside, being at normal pressure, exerts an outward thrust, which may break windows and cause the walls to fall outward.

One of the functions of the United States Weather Bureau is to assemble tornado statistics for all parts of the country. This task is performed by the bureau's climatological service, which is charged with the collection of climatic statistics in general, through the aid not only of the regular weather stations, of which there are about 200, but also of several hundred special stations, manned by

part-time paid observers, and a corps of about 4,500 cooperative observers, who serve without pay.

These officials experience great difficulty in gathering complete and accurate records of the tornadoes occurring within their several territories. Though the tornado has certain well-defined characteristics, including rapid rotation around a vertical axis, a pendant, more or less funnel-shaped cloud, and a duration of scarcely a minute at any one spot, other storms, such as violent thundersqualls, are frequently reported as tornadoes by untrained observers. Again, a storm with much likeness to the tornado type may give evidence of such slight energy that its true character remains doubtful. Another difficulty arises from the fact that the tornadoes sometimes come in groups, close to one another in place and time. In such cases it is often hard to say, from the reports available, how many of these storms actually occurred.

The statistics collected by the section directors are forwarded to the central office of the bureau in Washington. Here they undergo further critical analysis, and a comparison of the statistics for neighboring states frequently results in the elimination of errors. The data as assembled in Washington are also supplemented by information gathered from newspapers and other sources.

Recently the bureau made an attempt to test the completeness with which the newspapers report tornado information for the whole country. For over five months every issue of two dailies was carefully examined for reports of violent storms, whether described as tornadoes or not. The result showed that at least one-sixth of the tornadoes now reported by the bureau's own correspondents would remain unknown if these papers were used as the only sources of information.

The Weather Bureau and its predecessor, the Signal Service, gathered tornado statistics regularly for many years until 1897, when the work was discontinued. It was resumed at the beginning of the year 1916. The data collected and published since 1916 are thought to be much more complete and trustworthy than those for earlier periods. The average annual number of tornadoes during the years 1916-1926 was 101, and the average annual loss of life 294.

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For the convenience of teachers and scientific enthusiasts, these photographs are offered for sale. Any ten photographs (each postcard size $3\frac{1}{2} \times 5\frac{3}{8}$ inches) will be sent postpaid for only \$2.00. Enlargements, 8 x 10 inches, are \$1.00 each postpaid. Postcard pictures are finished only in black and white, but enlargements are offered either in black and white or sepia on buff stock. Please specify which.

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BIOLOGY

NATURE RAMBLINGS

By FRANK THONE



Snails

The early bird catches the worm, and the early snail catches the early leaf. So early gardeners will find themselves contending with these slow-but-sure devourers of verdure, which in some places make themselves terrible pests, very destructive and very hard to eradicate. Fortunately, in most garden plots they are few enough so that they may be looked upon with a somewhat more philosophic eye.

In a sense, they are strangers from another world, or at least from an old home which we have left so much more completely than they that we have forgotten it, and everything that comes from it seems strange. For the home ties of the snail are strongly with the world of queer beings that live in the water. He is the only mollusk that has come ashore to live, and even at that there are more snails that continue to live in the water than there are landlubber snails. And all the rest of his strange kindred, oysters and clams, octopus and cuttlefish, chiton and abalone and nautilus, stick to the original aquatic life. Even the land snails keep a strong memory of their old home, for they like deep woods and other damp habitats; a snail in the desert would be an anomaly.

This inability of snails to endure long drought is responsible for one of the best examples we have of evolution actually in progress. There are several volcanic islands in the South Pacific, on which deep, moist canyons are cut off from each other by high walls of lava rock. The upper parts of these ridges are extremely dry, veritable desert strips, while the canyon bottoms are rich, wet, tropical jungles. Each of these canyons has its own separate species of snails, which, unable to cross the ridges and mingle with its neighbors on either side, has developed its own peculiarities. On one of these islands, two surveys of the snail population, made at an interval of several years, have shown changes to be taking place even in so brief a time.

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ARCHAEOLOGY

Clues to Norsemen

A large flint spearhead made of material different from Indian spearheads of this state is arousing renewed interest in the stories of Norse adventurers in North America in the eleventh century. The spearhead, which was found on the beach at Pemaquid several years ago, is now in the possession of Walter B. Smith, who has made extensive studies of Indian remains in Maine.

In a report on the possibility of finding traces of the Norsemen, just made by Mr. Smith, he states that the spearhead may be Indian in origin. He points out, however, that it is not of flint such as the Indians used, but seems to be identical with a rock called halleflinta which is well known in Scandinavia. The fact that eleventh century Vikings had passed the age of stone tools adds to the mystery.

Where the Vikings landed in this country is not exactly known. The place described as Vinland is believed to have been somewhere along the Labrador Coast, and the accounts say that some of the explorers stayed several years.

"If the sagas are true," Mr. Smith says, "it seems improbable that some of the numerous bays of the extensive coast of Maine would have remained unknown to these hardy voyagers. They would have been lured here by the spirit of adventure or the hope of gain, or driven hither by storms."

Mr. Smith has spent some time vainly seeking Indian village sites and burial places around Pemaquid, in the hope of finding objects which the Indians might have obtained from the Norsemen. A number of shell heaps proved that Indians had once lived there, but no trace of European work was found in any of these.

Tools of iron possessed by the Norsemen would probably be masses of rust by this time, he points out. But most objects of copper, bronze, lead and silver would be still recognizable. Shards of Norse pottery might still survive, and also glass, particularly beads.

"If Norsemen actually discovered North America at that early date I believe there is still a possibility of finding proof of it, unless such proof is already destroyed," Mr. Smith concludes.

"With this possibility in mind it is fitting that collectors of Indian relics, all those who dig in shell-heaps, the discoverers of unknown inscriptions on rocks, and any one who finds puz-

zling objects of metal, pottery, or stone, which are occasionally uncovered from their burial places along our coast, should save them for identification.

"The majority of such 'finds' will, of course, prove to be of little consequence, but there is a possibility that something may be found of far greater significance. Unless such care is exercised, tangible objects of a possible Norse origin, perhaps at our very doors, may be carried away unrecognized by the junk man."

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EVOLUTION

Trying Another Tack

Checked but apparently not squelched by their defeat in the Arkansas State Senate, the Fundamentalists have now begun a new attack on science teaching in the Arkansas state schools. A petition is now being circulated with the object of placing the anti-evolution law before the people in 1928 for a direct referendum vote.

As predicted in last week's Science News-Letter, a "monkey bill," whose wording resembles that of the Tennessee law, has been introduced in the Florida legislature. It is predicted at present that the bill will not pass, and that if by any chance it does it will be vetoed by Governor Martin.

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ENTOMOLOGY

Poisonous Honey

Poisonous honey of the same kind that aroused the wonder of the ancient Greeks is still to be found in northern Asia Minor, according to Dr. K. Krause, who recently returned from a journey through that region. The honey, which was first mentioned by the soldier-historian Xenophon and later described by the philosopher-scientists Aristotle and Dioscorides, still has much the same effects upon those who eat it as it had in the days of classical antiquity. According to Dr. Krause's description, based on personal experiments with the poisonous sweet, it causes a giddiness and sometimes a brief loss of consciousness, followed by a short period of general malaise, "as though one had been on a spree," he says. Where the bees get the toxic nectar is still an unsettled question, but suspicion settles most strongly on two species of rhododendron abundant in the region, whose foliage is known to be poisonous to cattle.

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*Review of
Reviews*

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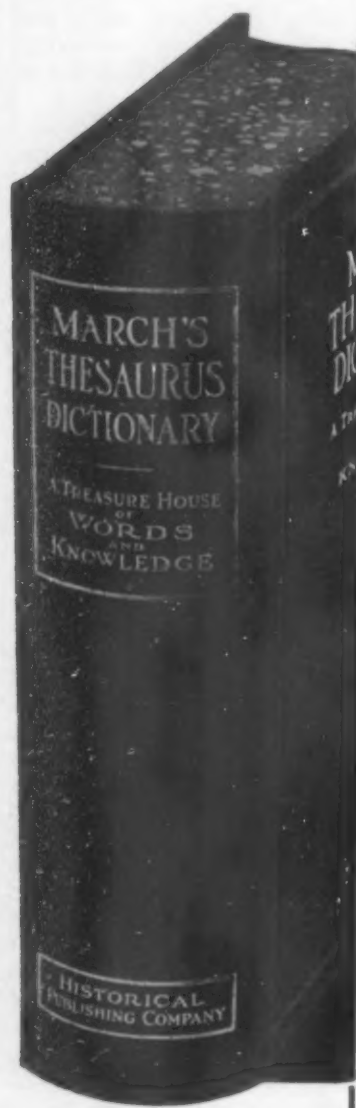
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Science News-Letter, April 23, 1927

MARCH'S THESAURUS DICTIONARY—F. A. March and F. A. March, Jr.—*Historical Publishing Co.* A now standard work, the first combination of the thesaurus and dictionary, newly augmented in usefulness by an up-to-date appendix, the scientific part of which was prepared by Science Service.

Science News-Letter, April 23, 1927

PSYCHOLOGY IN PERSONAL SELLING—A. J. Snow—*Shaw* (\$6). If you have any doubt as to the existence of a science of salesmanship, this book will remove it. After explaining so much of psychology as will make clear why customers' minds work the way they do, Mr. Snow proceeds to analyze the salesman, the customer and the sale from every angle. Many points in the book are used on experimental evidence and actual sales situations, and the explanations are punctuated by charts and tables. A useful contribution to applied psychology.

Science News-Letter, April 23, 1927

GENERAL SCIENCE

Science For The Millions

Quotation from THE ROMANCE OF THE ATOM. Benjamin Harrow. Boni and Liveright.

Profoundly affected as we are by scientific knowledge, is it wise to allow ourselves to be guided by men who are not only woefully ignorant of science, but, what is worse, have a contempt for it and for the "scientific attitude"? Such men—the men in authority—are the supervisors, who prescribe what is to be taught and what is to be told. They tell us, in defence of their unpardonable ignorance, that it is not "safe" to invite the "masses" (or the young) to think of important matters with a critically open mind. Hence we get, for example, a distortion of American history which we ask our young to absorb; as if a faithful account of American pioneers, recording not only their successes but their failures, were not a more wholesome lesson than distorting the truth. Why, to use an expression of Dickenson, must we "drug our mind with passion" until we reach the very antithesis of truth? Because people have been led to resist thought as they resist death. While to think and not to live is to live an incomplete life, to live and not to think is really not to live.

Science News-Letter, April 23, 1927

MINERALOGY

Blue Gem Named "Starlite"

Because it resembles a star twinkling at night more than any other precious stone, the blue zircon of Siam has been rechristened "Starlite" by Dr. George F. Kunz, well known gem expert, of New York City.

These flashing blue stones from Siam are unusual in that they are never blue at all when found in their natural state, but are brown or reddish in hue.

"The stones are placed in a crucible and burned in a fire from six to eight hours exposed to a solution of cobalt nitrate and potassium ferrocyanide," said Dr. Kunz, in announcing the new name to the New York Mineralogical Society. "The chemicals do not touch the stones which are being changed in color, but the fumes do the coloring. After cutting it is necessary to expose them again to the fire from five to 20 minutes.

"This is the most brilliant blue and green precious stone. The flash is more near that of the diamond of the same color and resembles the occasional sparks from copper contacts, especially when a trolley pole hits a wire. It also has the brilliancy and color of some stars."

Science News-Letter, April 23, 1927

Sexes "War" Before Birth

The "warfare between the sexes," with which literature and sociological speculation are filled, begins very early—before birth, in fact. Expectant mothers constantly favor their unborn daughters and handicap their unborn sons, without intending it or even knowing anything about it, according to some new facts brought forward by Dr. Oscar Riddle of the Station for Experimental Evolution of the Carnegie Institution of Washington.

Dr. Riddle calls attention to several chemical influences arising in the body of the mother, and transmitted through the blood plasma to the unborn male offspring, which act unfavorably on development and possibly sometimes kill the embryo altogether. One important member of this group of chemical compounds is the recently discovered hormone or internal secretion of the ovaries, which is known to stimulate the growth and activity of the characteristically female body-parts, but has an opposite, stunting and checking effect on male organs. If these effects are so pronounced in adult animals under brief experimental conditions, Professor Riddle argues, they must be even more marked when the supply of female hormone is kept up unremittently for days and weeks; and he cites clinical observations that tend to confirm his point of view.

In addition to the specific glandular secretions with definite "female-promoting" and "male-discouraging" action, Dr. Riddle also calls attention to evidence produced by recent researches that the nutritional requirements of females, especially in the very important matter of vitamins, are less than those of males. It would seem, therefore, that an unborn daughter would sometimes find these conditions also more adequate than would an unborn son.

To these unconscious but inevitable antagonisms of the mother toward her prospective male offspring, rather than to an inherent relative lack of vigor in the male, Dr. Riddle ascribes the well-known fact that an unexpectedly large proportion of males is found among babies born dead and prematurely.

Science News-Letter, April 23, 1927

The Labrador duck became extinct almost 50 years ago, probably because it could eat only a peculiar diet which became hard to get as population advanced.

How to Use Key-Word Feature of News-Letter

In order to aid in catching the items that concern you and to facilitate clipping and filing, a key word in small capitals has been printed on the right of the line above each article. The key words used fit into any system of classification, whether it be a straight alphabetical file, a system of your own devising, the Library of Congress classification or the Dewey system.

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GB Physical geography.
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GR Folklore.
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GV Sports and amusements. Games.
HC Economic history and conditions. National production.
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L Education.
M Music.
N Fine arts.
P Philology and linguistics.
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QA Mathematics.
QB Astronomy.
QC Physics.
QD Chemistry.
QE Geology.
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QM Human anatomy.
QP Physiology.
QR Bacteriology.
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250 Homiletic. Pastoral. Parochial
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CHEMISTRY

Vanadium Obtained Pure

The addition of a new metal, vanadium, to the world's resources, is announced by J. W. Marden and M. N. Rich, research scientists of the Westinghouse Lamp Company.

Vanadium has been known in its compounds for a long time, according to Dr. Marden and Dr. Rich, but in spite of a century of efforts on the part of chemists no one has previously been able to produce it in its pure form. The method employed by the authors is to heat a mixture of vanadic oxide, metallic calcium and calcium chloride in an electric furnace for an hour at a temperature of nearly 1,400 degrees Fahrenheit. After cooling and stirring the resulting mass in cold water, metallic vanadium is obtained in the form of beads.

"The beads of vanadium are very bright, have a steel-white color and are quite malleable, soft and ductile," say the authors. "They can be melted in a vacuum in a high-frequency induction furnace, rolled into wire and worked up into other shapes. As far as analysis can determine, they are 99.9 per cent. pure metal.

"There is no known use for this new metal at present, but undoubtedly it will have special properties that will make it useful. Tungsten, for example, was once a useless metal, but is now of inestimable value for filaments in incandescent lamps, for high-speed tool steel alloys and many other purposes. Vanadium may, in time, prove equally serviceable."

Science News-Letter, April 23, 1927

ZOOLOGY

Pearl Buttons Threatened

They wiped out the forests from the upper end of the Mississippi valley, and that let loose heavy spring floods. They build wing dams in the river to control the floods, and that threatens to take the pearl buttons off our shirts. For the pearl button industry of the United States, well over a million-dollar affair, centers around Muscatine, Iowa, and depends on the shells of the river mussels, more often called river clams, that formerly abounded on the muddy bottom of the Mississippi and its tributaries.

The difficulty is, explains Prof. N. M. Grier of Des Moines University, who has been investigating the situation, that the flood-controlling dams allow sediment to settle in their back-

waters close inshore, and that this sediment is smothering the mussels wholesale. Closed seasons over stretches of the river during the past five years have given an opportunity for the testing of views on the depletion of the mussel beds. As a result of his surveys, Prof. Grier recommends that the sloughs or side channels be permanently closed to mussel fishing, in order that they may furnish a convenient source of mussels for restocking the main stream when legislation looking toward the improvement of present unfavorable conditions shall have had time to become effective.

Science News-Letter, April 23, 1927

CHEMISTRY

Sugar From Wood

A new process for making sugar out of sawdust was described by Prof. Erik Haeggund of Abo at the coal and wood chemistry conference recently held in Stockholm, where he reported that at Geneva where the process is being tried on a commercial scale, from 65 to 70 per cent. of the sawdust by weight can be converted into sugar.

For Sweden, where forestry is one of the dominating industries and where most of the sugar has to be imported, the method is likely to become of the greatest importance. Several hundred thousand tons of "wood sugar" can be produced annually from easily accessible raw materials, it was stated.

Science News-Letter, April 23, 1927

PALEONTOLOGY

Love Song of a Trilobite

This week's prize-winning poem in the News-Letter scientific poetry contest.

To thee, dear trilobite, I sing my song—
 Recounting of thy virtues I'll prolong—
 It is my joyful duty to enumerate thy beauty
 From pygidium to cephalonic prong.
 On thy dorsal side and ventral side I gaze;
 Rare beauty each biramus limb displays;
 I behold the matchless grace of thy chitin carapace
 As it glistens in the ocean's opal rays.

With articulated segments I come kneeling;
 My antennae surely must disclose my feeling;

While a vision of thine axis is an optic prophylaxis,
 And thy thorax fairly sets my senses reeling.

Such symmetry, my Ordovician bud!
 Thy perfection needs no ornament nor dud.

How I love to see thee snooze upon thy bed of ooze
 Or coyly peer from underneath the mud.

O, descendant of thine annelidian sires,

To naught above thyself my soul aspires;

I would not leave our border to choose from higher order—

I quench all modern Pliocene desires.

Continuing this zoologic rhyme,
 I must mention thy glabella, most sublime!

O, thou fairest arthropodess, thou exell'st a Grecian goddess!

I would dwell with thee through Paleozoic time.

It thrills me, as I near thee, to surprise

The love light in thy thirty thousand eyes;*

Then I scan thy facial suture and I contemplate our future

With a sense of joy, as thou may'st well surmise.

If I had a heart 'twould palpitate for thee—

Its lack impairs my love in no degree—

I'm as capable of love as the Mesozoic dove

Which, I understand, will live in times to be.

No other bug of pre-historic class
 Can thy superb hypostema surpass;
 Most perfect of thy genus, thou outshin'st the coming Venus!

Thou art my all, thou sweet crustacean lass.

Sweetheart, I dream of thee both day and night,

And to protect thee I would quickly fight;

So, my dear, let naught alarm thee, for should any seek to harm thee

He shall feel my very fiercest trilobite.

—Arthur G. Bennett.

* "The number of lenses in the compound eye (of a trilobite) may vary from fourteen to the astonishing number of fifteen thousand. Imagine an animal with thirty thousand eyes!"
 —Pirsson and Schuchert, Textbook of Geology, 1915. Part II, p. 606.

Science News-Letter, April 23, 1927

The Years Have Taught Us

that only through the development of science does a nation, a profession, an industry progress. Science Service was established that the layman might know the world of science and its daily advancement. Science is not remote—the problems with which the inventor and discoverer contend are close at hand. Know step by step the way the men of science work to attain their objectives.

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